

Hyaloscyphaceae in Japan (3)*: *Venturiocistella japonica* sp. nov.

Tsuyoshi Hosoya^{1)**} and Yukio Harada²⁾

¹⁾ Sankyo Co., Ltd., Tsukuba Research Laboratories, 33 Miyukigaoka, Tsukuba, Ibaraki 305-0841, Japan

²⁾ Faculty of Agriculture and Life Science, Hirosaki University, 3, Bunkyo-cho, Hirosaki, Aomori 036-8561, Japan

Accepted for publication 21 July 1999

***Venturiocistella japonica*, a new species in the Hyaloscyphaceae, Leotiales, is described and illustrated. The fungus is featured by minute apothecia and hairs with secondary morphogenesis.**

Key Words—discomycetes; Hyaloscyphaceae; Japan; new species; *Venturiocistella*.

A minute discomycete was collected from *Cercidiphyllum* leaves in the Tohoku area. This fungus was characterized by having stiff hairs of two kinds and found to be an undescribed species of the genus *Venturiocistella* Raitv., Hyaloscyphaceae, previously not recorded from Japan.

Materials and Methods

Collection, isolation, and light microscopic observation followed Hosoya and Otani (1997). For SEM observation, gently air-dried apothecia were used because the chemicals used in the fixation would affect hair granulation or vestures such as resinous materials or crystals, or both. The specimen was gold-coated in a Hitachi E-1030 Ion Coater and observed using a Hitachi S-4500 scanning electron microscope operated at 5–20 kV.

Descriptions

Venturiocistella japonica Hosoya, Y. Harada & Y. Otani, sp. nov. Figs. 1–3

Apothecia gregaria vel sparsa, breviter stipitata, usque ad 300 μm alta, plana vel profunde concava, cum margine albo-pruinosa; receptaculum pallidebrunneum. Excipulum ectale "textura prismatica", ex cellulis crassitunicatis 11–20 \times 3–5 μm compositum, intra cum strato uno ex hyphis intricatis gelatinosis granulatis tenuitunicatis ad 1.5 μm latis limitatum. Pili primarii cylindrici, apice obtusi, hyalini vel fusco-brunnei, 4 μm lati, usque 50 μm longi, aseptati, omnino granulis spissibus vel grossibus obtecti, deinde ad apicem pilo secundario gradatim vel abrupte angusto spinoso obscure brunneo apicaliter laevi basi granulati proliferantes. Asci 32–41 \times 5.5–6.5 μm , cylindraco-clavati vel saccati, basi lati, ex hamulis surgentes, apice conici, poro iodo caerulescenti sine KOH.

Ascospores 6–9 \times 1.5–2 μm , clavatae, cuneiformes. Paraphyses non copiosae, filiformes, in matrice gelatinosa investientes, aseptatae vel septatae, 1–1.5 μm latae, ascos parum superantes.

Holotypus. JAPAN-HONSHU: Ohmura, Shizukuishi-cho, Iwate Pref., on decaying *Cercidiphyllum japonicum* leaves, 10-V-94, col. T. Hosoya and T. Kubono. TNS-F-100239 (culture SANK 14497)

Etymology. Latin, refers to specific epithet of the host, *C. japonicum*, restricted to Japan.

Apothecia gregarious or scattered, short stipitate, up to 300 μm high; disc flat to deep concave; margin elevated, vested by short hyaline to pale-colored hairs giving somewhat pruinose appearance; receptacle pale brown, obscured by long brown hairs. Ectal excipulum textura prismatica, composed of thick-walled cells 11–20 \times 3–5 μm , lined by a layer of gelatinized intricate hyphae, granulate, thin-walled, pale brown, up to 1.5 μm thick. Hairs of two kinds. Primary hairs cylindrical with obtuse apex, distributed near the margin, but also on ectal excipular outside, hyaline, becoming pale brown, 4 μm thick, up to 50 μm long, aseptate, walls finely to coarsely granulate allover. Secondary hairs formed by the proliferous elongation at the apex of primary hairs, gradually narrowed, occasionally abruptly narrowed, spinous, dark brown, basal portion where residue of the primary hairs remained granulate, extended portion smooth toward the sharply pointed apex. Asci 32–41 \times 5.5–6.5 μm , cylindrical clavate to saccate with broad base, arising from croziers; apex conical, pore MLZ+ without KOH pretreatment. Ascospores 6–9 \times 1.5–2 μm , clavate, cuneiform. Paraphyses not abundant, filiform, covered with thin gelatinous layer agglutinating the paraphyses, aseptate or septate, 1–1.5 μm thick, not exceeding the asci.

Colony of SANK 14397 and SANK 14497 on PDA identical, 16 mm in diam (23°C, 3 wk) deep and dense, velvety-floccose, remarkably convex, white, almost black from the reverse, but partially showing brownish

* (2): Mycoscience 38: 187–205. 1997.

** E-mail: hosoya@tsuku.sankyo.co.jp

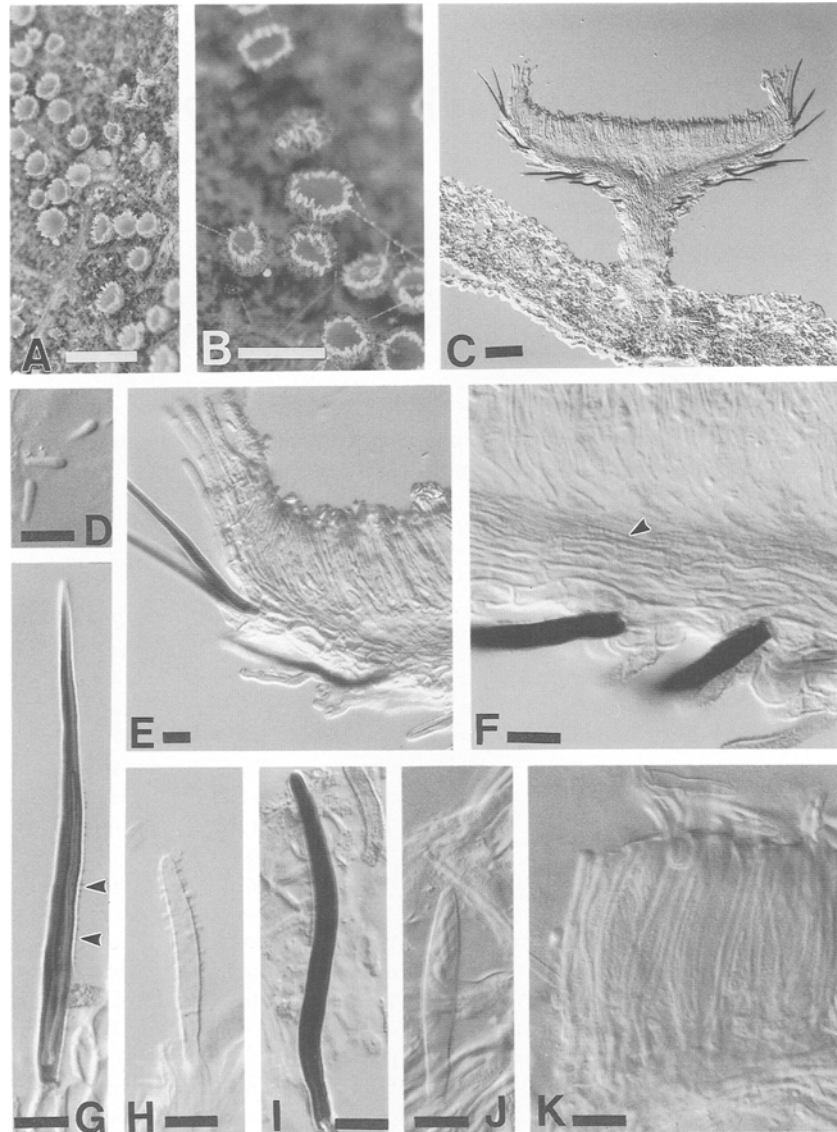


Fig. 1. *Venturiocistella japonica* (TNS-F-100239).

A. Fresh apothecia on *Cercidiphyllum* leaf. B. Close-up view of fresh apothecia. Note white pruinose margin because of the primary hairs and dark brown secondary hairs. C. Vertical section of an apothecium. D. Ascospores. E. Vertical section at the margin. F. Close-up view of prismatic ectal excipular cells giving rise to hairs, and inner granulate, slightly gelatinized, pale brown hyphae (arrowhead). G. Mature secondary hair. Note granulation at the lower surface (arrowheads). H. Uncolored, coarsely granulate primary hair. I. Secondary hair initial. Note coloration and elongated, but still blunt, apex due to protrusion. J. Ascus. K. Part of the hymenium showing asci and paraphyses embedded in gelatinous matrix. Scales. A, 1 mm; B, 0.5 mm; C, 50 μ m; D-K, 10 μ m.

tint. Golden Yellow drops formed on the colony. Context tough and brittle. Aerial mycelium white, well developed at the center. Sectors and zonations absent. Margin distinct, entire, superficial.

Specimens examined. HONSHU: Oirase-keiryu, Towada-lake, Aomori Pref., on decaying *Cercidiphyllum japonicum* leaves, 18-V-90, TRL-81, col. Harada; 18-V-91, TRL-334, TRL-608, TRL-609, col. Harada, Hosoya, Kudo, Otani; 13-VI-90, TRL-924 (culture SANK 14397), TRL-925, col. Harada; Ohmura, Shizukuishi-cho, Iwate Pref., on decaying *C. japonicum* leaves, 15-V-95, TRL-

1146.

Notes. The genus *Venturiocistella* was established as a monotypic genus by Raitviir (1978), based on *Pirotaea venturioides* Rom. & Sacc. (Saccardo, 1889), which was selected as the type. Raitviir (1978) pointed out the morphological similarity between *Venturiocistella* and *Cistella* Quél., but noted dark-colored, spiny hairs for the former. Seven species are currently accepted (Baral, 1993). Four of them are recombinations previously published as *Trichodiscus* Kirschst. by Graddon (1974, 1977, 1980).

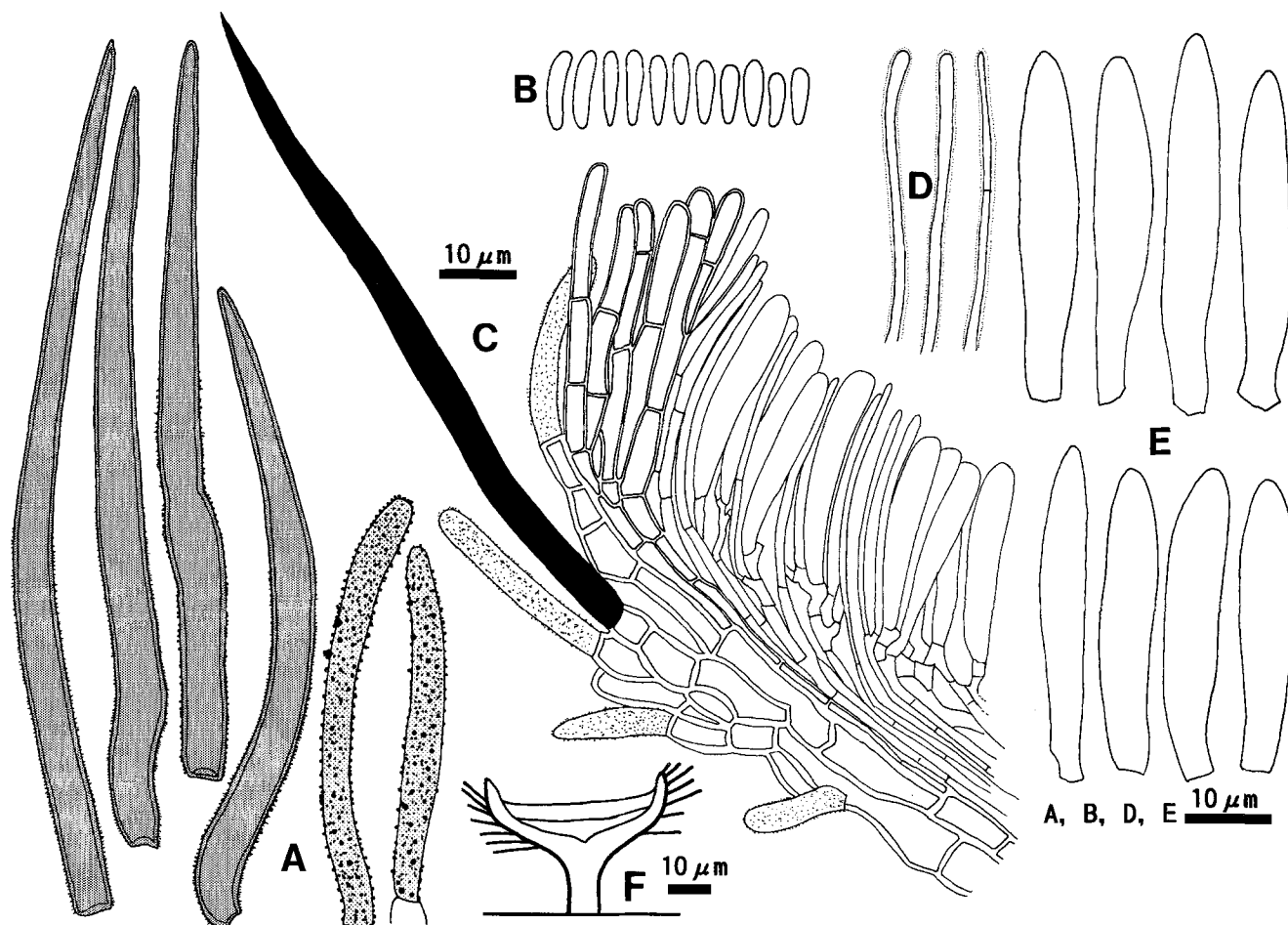


Fig. 2. *Venturiocistella japonica* (TNS-F-100239).

A. Hairs. Two at the right are primary, and the rest secondary. B. Ascospores. C. Vertical section showing the margin. D. Paraphyses. Gelatinous matrix outlined as dots. E. Asci. F. Schematic drawing of the apothecium showing the outline of the structure.

The most characteristic feature of *Venturiocistella* is the dimorphism of the hairs, i.e., dark-colored, long spiny hairs and pale-colored, shorter hairs with granulation (Raitviir, 1978). Surface granulation on the former hairs has previously been ignored (Galán and Raitviir, 1994; Raitviir, 1978). Baral (1993) carefully examined the surface of the spiny hairs and described and illustrated the basal granulations.

Because the spiny hairs were found to be formed by secondary morphogenesis involving proliferous elongation at the apex of the obtuse hairs, we propose to call these secondary and primary hairs, respectively. Similar hair dimorphism based on secondary morphogenesis was observed in *Albotricha* Raitv. and *Dasyscyphella* Tranzschel, and *Trichopezizella* Raitv., though not stressed (Raitviir, 1970).

Most authors did not mention the sequential change of hair morphology in *Venturiocistella*, except for Saccardo (1889), who noted "*setis rectis subulatis fusco-opacis, 50–270 × 4–6, primo obtutu ob setulas subfusca, verum albida.*"

The mycological features of *V. japonica* perfectly

accord with the diagnostic features of *Venturiocistella* given by Baral (1993). Single-celled hairs distinguish *V. japonica* from *V. heterotricha* (Graddon) Baral. The presence of paraphyses distinguishes *V. japonica* from *V. diversipila* (Graddon) Baral. Single-celled ascospores distinguish *V. japonica* from *V. ulicicola* (Graddon) Baral. The combination of micro-dimensions of apothecial elements distinguishes *V. japonica* from *V. gaylussaciae* Baral, *V. pini* (Höhn.) Baral, *V. venturioides* (Sacc. & Rom.) Raitv. and an unnamed species of *Venturiocistella* (Baral, 1993). Moreover, gelatinized tissue in the inner ectal excipulum and the covering of paraphyses by gelatinous material seem to be unique features of *V. japonica*.

Cercidiphyllum was not hitherto reported as the host of *Venturiocistella* species. Host specificity is suggested for most members of *Venturiocistella*, except for *V. diversipila*. A strong host preference was noticed for *V. japonica*, but pathogenicity was not recognized.

Raitviir (1987) classified *Venturiocistella* in the subfamily Lachnoideae with *Cistella*. The secondary morphogenesis of the hairs is seen in some members of

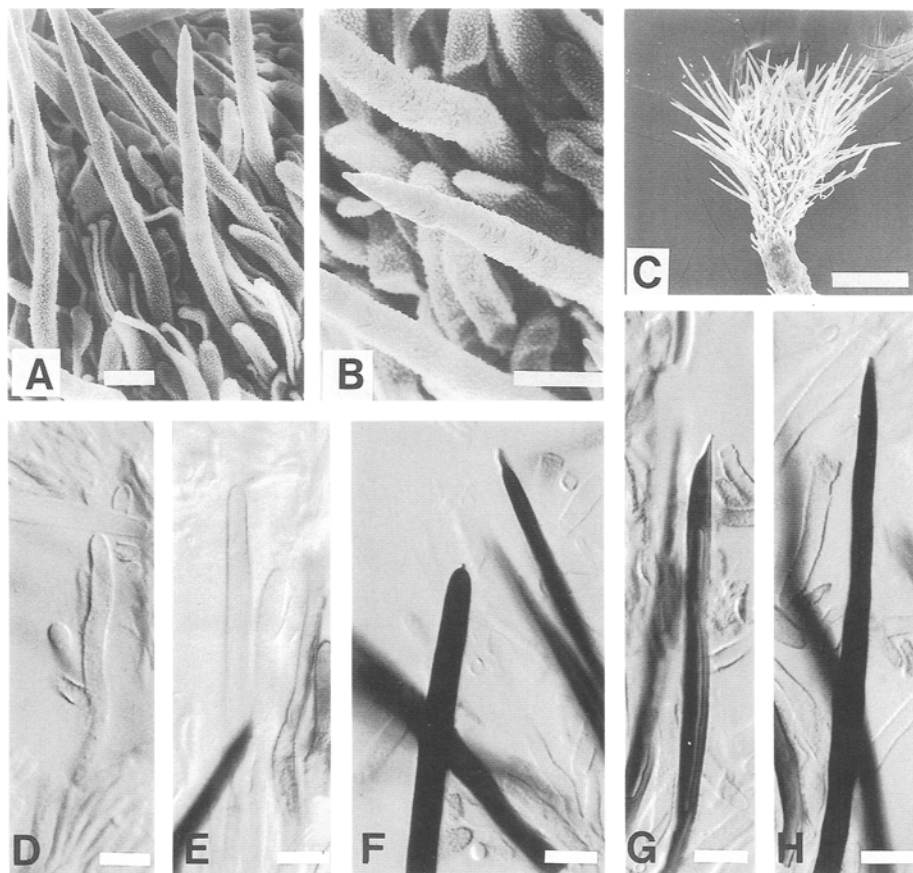


Fig. 3. A–C, SEM photograph of *Venturiocistella japonica* (TNS-F-100239). A–B. Secondary hairs. Note smooth, pointed apices and granulate base. C. Apothecium of *V. japonica* under lower magnification. D–H. Various stages at secondary morphogenesis in *V. japonica*. D. Primary hairs. E. Dark-colored primary hair before proliferation. F–G. Secondary hair initials showing apical proliferation. H. Secondary hairs. Scales. A, B, D–H, 10 μm ; C, 100 μm .

Lachnoideae. However, no member of *Venturiocistella* has lanceolate paraphyses, which is a typical feature of members of Lachnoideae. The intra-familial position of *Cistella* was questioned (Cantrell and Hanlin, 1997), and the relationship of *Venturiocistella* and *Cistella* requires further investigation. On the other hand, small apothecia, filiform paraphyses not exceeding the asci, and aseptate hairs of *Venturiocistella* are characteristics of Hyaloscyphoideae. Further examination is also required to settle the intra-familial position of *Venturiocistella*.

Acknowledgements—We express our gratitude to the late Dr. Y. Otani, who kindly brought the materials to our attention.

Literature cited

- Baral, H. O. 1993. Beiträge zur Taxonomie der Discomyceten III. *Z. Mykol.* **59**: 3–22.
- Cantrell, S. A. and Hanlin, R. T. 1997. Phylogenetic relationship in the family Hyaloscyphaceae inferred from sequences of ITS regions, 5.8S ribosomal DNA and morphological characters. *Mycologia* **89**: 745–755.
- Galán, R. and Raitviir, A. 1994. Some new or interesting species of Hyaloscyphaceae from Spain. *Nova Hedwig.* **58**: 453–473.
- Graddon, W. D. 1974. Some new discomycete species. *Trans. Br. Mycol. Soc.* **63**: 475–485.
- Graddon, W. D. 1977. Some new discomycete species: 4. *Trans. Br. Mycol. Soc.* **69**: 255–273.
- Graddon, W. D. 1980. Some new discomycete species: 5. *Trans. Br. Mycol. Soc.* **74**: 265–269.
- Hosoya, T. and Otani, Y. 1997. Hyaloscyphaceae in Japan (1): Non-glassy-haired members of the tribe Hyaloscyphaeae. *Mycoscience* **38**: 171–186.
- Raitviir, A. 1970. Synopsis of the Hyaloscyphaceae. *Scripta Mycol.* **1**: 1–115.
- Raitviir, A. 1978. Systematics of *Cistella* and closely related taxa. *Scripta Mycol.* **8**: 147–159.
- Raitviir, A. G. 1987. System of hyaloscyphic fungi. *Mikologia i Fitopatologiya* **21**: 200–206.
- Saccardo, P. A. 1889. *Sylloge Fungorum* **8**: 388. Padova.